

## NEURO-SEMANTIC AND NEURO-LINGUISTIC MECHANISMS OF EXTENSIONALIZATION.

GENERAL SEMANTICS AS A NATURAL EXPERIMENTAL SCIENCE.\*

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General Semantics is described as a General Theory of Values, and every psycho-logical reaction (semantic reaction) turns out to be an *evaluating* reaction of a non-elementalistic character which does not involve the splitting of semantic reaction into "intellect" and "emotions." Adjustment then becomes "proper evaluation," maladjustment a problem of "misevaluation." By using the term *evaluation* as a fundamental term, we bridge methodologically and linguistically the exact sciences with other sciences, psychiatry included. We gain thereby powerful neuro-linguistic and neuro-semantic *direct methods* for education and psychotherapy, the more so because evaluation represents a multiordinal mechanism, as exemplified later. Additionally we are enabled to deal with "causes" instead of "effects" or "symptoms." General Semantics is a strictly *experimental* natural science, with methods which in the two years since their publication have been successfully applied by psychiatrists, educators and the author.

Anthropology was originated by British scientists. They collected a great deal of valuable information about primitive peoples; although the recorded facts were correct, the *interpretations* were vitiated by reading into the primitive man some sort of imperfect white man reactions. A similar error is made when we read into a child "small man" reactions. The French and Polish school of anthropology corrected this error and studied primitive man on *his primitive level*. Analysis shows that the white man has *never been studied on the white level* and that we have read into the white man, animal, primitive or infantile reactions. Paradoxical as it may seem we have succeeded in making the study of primitive man scientific, and we have not as yet succeeded in applying scientific methods to ourselves.

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General Semantics because of extensional (physico-mathematical) methods accomplishes this, requiring a complete revision of existing doctrines. The above formulates a genuine challenge which modern science has to meet, to prevent the nervous degeneration of the white race, of which Carrel warns.

To what extent this indictment is justified may be illustrated by endless quotations from practically all existing "scientific" literature, but here I will quote only an authoritative statement by two specialists. "The quality of responding to the signals, signs or symbols . . . may be looked on as the unique expression of the highest type of integrative function. This quality, termed 'signalization' (Pavlov) OR 'symbolization' (A. Meyer), is the common denominator of all *conditioned* responses, which may differ enormously, etc." <sup>1</sup> (Italics are mine, A. K.)

The empirical effectiveness of General Semantics depends, among others, on the *amplification* of the Pavlov *animal* reflexology to the *human* level by introducing "degrees of conditionality," (see pp. 328, 332-343) <sup>2</sup> as yet noticed only by *one* psychiatric reviewer in the Archivio Generale di Neurologia Psichiatria e Psicoanalisi, No. 1 and 2, Vol. XVI, 1935. Obviously "conditioned" reactions gives an incorrect and misleading terminology because: (1) Every reaction is *conditioned* by something, and (2) "conditioned" reactions *cannot have degrees*, essential for the discrimination between animal and human reactions, and to a large extent between "sane" and pathological human reactions.

In General Semantics we deal with absolute individuals, Smith<sub>1</sub>, Smith<sub>2</sub>, etc., and we must sharply discriminate between animal "signal," reflex reactions, of *low* degree conditionality, and human "symbol" reactions which involve "meaning," *evaluation*, etc., of potential *full*, infinite-valued *conditionality*.

The "mentally" ill patient of Prince who had hay fever and *produced* an attack at the sight of *paper roses* (p. 128) <sup>2</sup> illustrates both these points: (1) The *low degree* of conditionality of his reactions, and (2) the animalistic, reflex or humanly ill "signal reactions," at the *sight* of paper roses.

<sup>1</sup> Archives of Neurology and Psychiatry, May 1935, p. 1033.

<sup>2</sup> Science and Sanity, An Introduction to Non-aristotelian Systems and General Semantics, by Alfred Korzybski, Science Press Printing Co., Lancaster, Pa.

Thus even in 1935 in serious papers, "symbols" were ascribed to dogs, and Smith<sub>n</sub>'s reactions were read into dogs; and the dog's "signal" reactions were read into Smith<sub>n</sub>. In fact if we accept the terms "conditioned," and "signal" OR "symbol," we make it impossible to treat Smith<sub>n</sub> on the white man's level. The term "conditioned" prevents the considerations of *degrees of conditionality* so characteristic of *human sane* reactions.

Such identification ("OR") of "signal" with "symbol" reads human reactions into dogs, helping also to read animal reactions into human reactions, and successfully prevents the discrimination between "sanity" and "insanity," and the treatment of humans on the human level. The animal reflexologist, through similar "confusion of tongues," and making the degrees of conditionality impossible, reads the reactions of dogs into humans, making also the treatment of humans as humans, and a theory of sanity impossible.

Other examples are abundant everywhere, here we will illustrate only the discrepancies taken from the field of medicine.

The National Committee for Mental Hygiene published a report in 1933, *Psychiatry in Medical Education*, prepared by a number of leading psychiatrists, which is to be considered as an authoritative document. The report begins with the statement: "Dissatisfaction with the medical curriculum is met with on every side." It is common knowledge that most physicians are ignorant of psychiatry, and resort to every kind of useless or harmful therapy and even surgical operations, to the great detriment of the patients, while the sources of the troubles are psycho-logical. Today, medicine which neglects psychiatry represents nothing more than glorified veterinary science. How about psychiatry? The situation is also sad. Let the psychiatric report speak for itself: "It was held . . . and properly, that the student was *unfitted* to tackle the problems presented by diseased tissue and *perverted function* until he had become thoroughly acquainted with healthy tissue and *normal function*" (p. 48). All human psycho-logical reactions ultimately represent problems of *evaluation*, and all psychopathological mechanisms, problems of *misevaluation*. How can psychiatry and psychotherapy become *scientific* and so more *efficient* if psychiatrists neglect General Semantics which discloses the mechanisms of "normal function" and the general factors of evalua-

tion which made science what it is. Further on p. 49 we read: "Medical men knew, and the laymen could not know, that *superficial snatches of medical learning* were already a powerful and prevalent factor in *promoting mental ill-health* throughout the community, etc." (in both quotations the italics are mine, A. K.)

The last quotation describes well-known and serious conditions, yet what psychiatry has entirely disregarded to date is the obvious fact that in dealing with the functioning and reactions of human organisms very often *mere ignorance is impossible*. We can have only *false knowledge*. This through the projecting mechanisms plays the well-known harmful rôle of "superficial snatches of medical learning." Thus for instance the term "sex glands" is a most confusing misnomer. The gonads ("sex glands") are internal secretion glands, and perhaps nine-tenths of their functioning is vitalizing the whole organism, *brain included*, and only one-tenth of their function may be called "sex proper." The above ratio is only approximate, more accuracy is not needed here for our purpose, as *any ratio* would illustrate the fact that we are *directly aware* of the one-tenth functioning and unless told by science, *entirely unaware* or *ignorant* of the nine-tenths functioning. The nervous mechanisms of projection, as, for instance, hysterical mechanisms which can produce wounds (stigmata), and which depend on psycho-logical disturbances are well known. In the case of the gonads (and other *functional* units) we see that mere ignorance is impossible, and without the full facts of modern science we have only *false knowledge* and *project* the one-tenth function on the nine-tenths function, and vice versa, *disorganizing both*. Thus it appears definitely that as the nervous system of the white man *produced science*, for the proper working of our white nervous systems, we must *know* the elementary data of physiology and neurology, otherwise *false knowledge* plays havoc with our nervous systems. The above radically changes our attitude toward science and its rôle in the white man's life; namely, that the minimum of scientific structural knowledge about the world we live in and ourselves, modern at each date, plays a neurological, sanity rôle. The empirical evidence is overwhelming, but to understand these mechanisms we cannot orient ourselves any longer by the traditional, two-valued, intensional, verbalistic, aristotelian orientations, based on dead anatomical "organs," "fibers," etc., apart from their

functioning ("schemes" in the language of Carrel). Instead we must have a new, modern, scientific, infinite-valued, *extensional*, non-aristotelian, 1936, *colloido-quantum* orientation which alone will allow us to deal with "realities," 1936.

Incidentally we discover that although the neuro-physiological projecting mechanisms are well known, yet this knowledge has not been utilized constructively even by the medical profession. The hysterical and other projection mechanisms establish an important and positive neuro-colloidal fact, that *such mechanisms do exist*. It is not realized that as low as in dogs projection mechanisms make "false pregnancy" quite common, showing how fundamental those mechanisms are. These mechanisms are utilized at present mostly for human detriment, but once we abandon animalistic signal reactions, with their colloidal concomitants, and pass to human symbol reactions, also with their colloidal concomitants, there is no reason why these mechanisms should not be made to work constructively. Some of the empirical results in extensionalization seem to point in this direction, in conformity with the latest experimental results. Doctor Gregory S. Razran duplicated the experiments of Pavlov on humans and discovered that human symbol reactions differ widely from animal signal reactions and are influenced more by attitudes, or, in general, semantic reactions, than by outward stimuli (see pp. 332-340).<sup>3</sup>

In his seminars the writer was astonished to observe what *automatic* and beneficial effect such elimination of structural false knowledge and the transformation of signal into symbol reactions, had on the students. The realization, for instance, of the one-tenth and nine-tenths ratio of the functioning of the gonads without any "preaching" eliminated in many instances some serious "sex" troubles. The *automatic* character of the beneficial working of General Semantics on other problems of human adjustment without any "preaching" is a significant practical point. Case histories are accumulating rapidly.

Once General Semantics is applied, and we concentrate on *evaluating* reactions, many issues become workable. Thus if we try to speak to modern youth in terms of "morals," "ethics," "honesty,"

<sup>3</sup> Science and Sanity, An Introduction to Non-aristotelian Systems and General Semantics, by Alfred Korzybski, Science Press Printing Co., Lancaster, Pa.

and what not, and we are told "I do not believe in the old bunk," we are dismissed for good. There is no comeback, no matter how beneficial our advice could possibly be. But if we speak in *terms of evaluation*, and we are carelessly dismissed in a similar way, this will not work because *lack of evaluation is evaluation of low order*. We are dealing with a *multiordinal mechanism* (see index of Science and Sanity) which can *not* be dismissed, and remains active.

The main principle of General Semantics is that for optimum adjustment, "mental" health, we need *predictability*. The main usefulness of science depends on this predictability which eliminates shocks. Predictability of a form of representation, be it a map or a *language*, depends on the *similarity of structure* of the form of representation with the events represented. For instance, in actuality Chicago is *between* San Francisco and New York. If we had a map *not* similar in structure to the territory; namely, representing San Francisco *between* Chicago and New York our traveling would become *unpredictable* and we would have many shocks forthcoming, which would be avoidable, if the map were *similar in structure*. This applies to *any form of representation, LANGUAGE included*. Our personal, social, economic or political adjustment and, in fact, the problem of *sanity* of the white race depends on whether the *language* we use is similar, or *not* similar, in structure to the world and our organisms.

This is not a problem for speculation but a *new* problem of *fact*, to be ascertained by *enquiry into facts*—1936. The problems are simple and definite. In nature "matter," "space," "time," *cannot* be divided, or split, though *verbally* we can split them. Actually "body" and "mind"; "intellect" and "emotions," etc., *cannot* be divided; verbally we can split them. Obviously these forms of representation or languages we use are *not* similar in structure to the facts and, in principle, predictability becomes impossible.

Once facts become obvious, the white man as a rule solves his problems. Thus in physics Einstein and his co-workers have produced a non-elementalistic language of space-time, similar in structure to the facts of the world. Most important empirical consequences have already been reached from this linguistic adjustment. Similarly in human affairs, General Semantics introduces *non-elementalistic* terminology and empirical results follow automatically, as mentioned before.

Definitions by "intension" (spelled with an "s"), define by aristotelian "properties," thus a "man" may be defined, say, as a "featherless biped." In a world of absolute individuals, Smith<sub>1</sub>, Smith<sub>2</sub>, etc., such an intensional definition applies to *everybody* and covers *nobody*. Intensional existing orientations and *language* appear *not* "similar in structure" to the *facts* of life, and predictability is made impossible. Known, yet avoidable, human tragedies follow.

Mathematical and semantic extensional definitions would *exhibit* the individuals and define "man" as "a class of individuals, Smith<sub>1</sub>, Smith<sub>2</sub>, etc., SIMILAR IN STRUCTURE to the *facts of life*." In the past we have had need for extension and so had such extensional *expressions* as "this chair," yet the actual *words* were intensional. If we say "chair<sub>1</sub>," something crucial yet unexpected happens; namely, we have radically changed the *structure* of language (intensional to extensional) without changing the language. We have made the language similar in structure to the facts of life, and optimum predictability and better adjustment become empirical facts.

Extensionalization is not a new cultural fact in our history. Some time ago we needed for further progress in mathematics an infinite number of symbols, which no number of alphabets could supply. The extensionalization of one letter, say "*x*" produced the desirable change: namely,  $x_1, x_2, x_3$ , etc., supplied the needed infinite number of symbols. At present in the tensor calculus, on which modern physics depends, we have reached the maximum of extensionalization of 1936; we have symbols like  $\delta_{pq}^{mn}$  and these five letters allow us to handle many complex equations as an unit, facilitating enormously the work.

In life we have come to a similar impasse. Our lives are lived under *actual* conditions made by *extensional* science, while our orientations remain hopelessly *intensional*. Adjustment—and so sanity—is less and less possible, and with the further advance of science increasingly impossible. We have thus either to abandon *extensional* scientific advance, to save our sanity, or extensionalize our orientations and the structure of our language.

General Semantics suggests that we extensionalize our orientations. This means a revision of our old semi-primitive orientations and making them scientific 1936. This is accomplished by similar

simple devices as was accomplished in mathematics. The extensional devices are as follows: (1) Indexes. (2) Dates. (3) Quotes. (4) Hyphens. (5) Etc. They should be continuously in our heads and orientations, although seldom used explicitly outside of explicit difficulties.

Those interested in this subject will find further details in the book *Science and Sanity*. Although extensionalization seems innocent, it is not, as it involves an *automatic stimulation* of the cerebral cortex, with all the neurological benefits for the "organism-as-a-whole." The mechanism is simple and workable in practice.

The human cerebral cortex has many functions, among others (1) dynamogenic effects, (2) differential activation, which taken *separately* (elementalistically) represent only *verbal* fictions, non-existing in nature ("schemes" of Carrel), because the nervous system works as-a-whole (non-elementalistically). There is, however, one function of the cerebral cortex which is not a verbal fiction; namely, that the cerebral cortex introduces a *functional delay in reactions*. If we can introduce *automatic* and *habitual* delay in reactions, we *automatically stimulate* the cortex, with all beneficial consequences following. It is evident that extensionalization does this. If we cease dealing with intensional verbal fictions such as "man," "chair," etc., and deal with extensional labels for realities, such as Smith<sub>1</sub>, Smith<sub>2</sub>, etc., or chair<sub>1</sub>, chair<sub>2</sub>, etc. (dates included), we *automatically order* the reactions by introducing four-dimensional *seriation*, which in turn *automatically* results in a *permanent delay in reactions* for a small fraction of a second, and so engages the participation of the cortex in the reactions.

Only the understanding of these neuro-semantic, neuro-linguistic and neuro-muscular mechanisms makes certain of the results obtained by Doctor Rosett in his experiments with epileptics comprehensible and significant from a new angle.<sup>8</sup> Rosett made a study of epileptics. He trained them over a long period of time to breathe or to perform simple movements in synchrony with the beats of a metronome. Epilepsy improved in various degrees, however not in all cases, but in every case treated by this method, character, temper, "mentality," reading interests, were markedly improved. It should be emphasized that no other educational means were employed and so the above "character" results were achieved

automatically (see case reports, p. 789).<sup>4</sup> The explanation seems simple. An organism is not a machine in the sense of a metronome. To synchronize our reactions with a metronome we must *adjust* them, keep them under control, and so automatically *delay the reactions*, or accelerate them. In the case of the cortex the delay is of importance, and so the introduction of this *delay* by Rosett's method of training under peculiarly difficult conditions brought about the stimulation of the cortex with the above mentioned consequences. The findings of Rosett are fundamental for General Semantics in connection with *ordering the reactions* by the training with the Structural Differential, supplying this coveted *delay in reaction* and a complete co-ordination of *neuro-semantic*, *neuro-linguistic* and *neuro-muscular organism-as-a-whole* issues involved.

General Semantics, through the method of *extensionalization*, automatically introduces this desirable constant delay in reactions for a small fraction of a second, not detrimental in life, yet of very serious *neurological* value, transforming the animalistic (humanly pathological) *signal* reactions of *low* conditionality into human *symbol* reactions of *full conditionality*, by the stimulation of the cerebral cortex. The above explains the empirical and automatic beneficial results.

Science and Sanity, An Introduction to Non-aristotelian Systems and General Semantics was published in the autumn of 1933, introducing General Semantics to the public (General Theory of Values). Since then co-workers have *applied* extensionalization to "mentally" ill, in hospitals and private psychiatric practice; reformatories; education, both of abnormal and "normal" persons in some schools, colleges and universities; and finally in private adjustment of the individual lives of different lay students. General Semantics has also been utilized by specialists in various branches of science to revise the older formulations and difficulties. Some of the experimental results have been reported before the First American Congress for General Semantics, held, March 1 and 2, 1935, at Washington State Normal School, Ellensburg, Washington, in various scientific papers and also in correspondence with the writer. The results seem uniform and standard; namely, that

<sup>4</sup> "The Epileptic Seizure, Its Relation to Normal Thought and Normal Action," by Joshua Rosett, M.D. Archives of Neurology and Psychiatry, April 1929.

“extensionalization” is in principle, workable when applied in practice. Some of the results are: (1) After a few months training some “mental” cases recovered, without relapses thus far; (2) subnormal students became practically “average”; (3) some of the poorest students became the best; (4) students overcame unclassified blockages and handicaps, became better adjusted to life and found their studies easier; (5) practically in 99 per cent of cases, in *serious students* of General Semantics, some individual beneficial results in adjustment followed; (6) a number of psychiatrists report that they find semantic methods efficient in shortening the period of psychotherapy, allowing also for group treatment; (7) the writer in his seminars has verified these seemingly automatic general results.

In conclusion it may be stated that the white race has come to an impasse, the *actual* conditions of life are shaped by *extensional* science; while our inner orientations and the structure of language remain *intensional*. Increasing maladjustments must follow, as we actually observe. Future issues are clear from the point of view of *predictability*, either we return to primitive states and abolish extensional science, and then perhaps survive; or we transform our orientations to conform with the actualities of our lives, in other words extensionalize them. It seems that this choice must be made as a general cultural issue and we must stop reading animal and primitive reactions into the white man and by extensional scientific analysis find out what standards of evaluation belong to the white man's level and correspond to the functioning of his nervous system. In General Semantics such an attempt has been made, and so far results seem to justify it.